

BAE -- 10/626,550
Client/Matter: 040021-0305239

REMARKS

Claims 1 and 5-8 are currently pending. By this Amendment, claim 1 is amended. Support for the amendment to claim 1 may be found in Figure 9 and in the specification on page 4, lines 12-15. No new matter is added. Reconsideration in view of the above-outlined amendments and the following remarks is respectfully requested.

Claims 1 and 5-8 were rejected under 35 USC § 102(b) based upon U.S. Patent No. 6,387,821 to Aoki. This rejection is respectfully traversed.

Applicant respectfully submits that Aoki fails to disclose the method set forth in amended claim 1. Aoki does not disclose forming a bottom metal pattern on a semiconductor substrate and then forming a low temperature oxide on the semiconductor substrate including the bottom metal pattern. In contrast, Aoki discloses forming a hydrogen silsequioxane ("HSC") layer 102 on a film 101. The layer 102 is etched. Layers of a TiN film and copper are applied to form the lower wiring. Aoki uses the HSQ layer to form the lower wiring, it is not deposited on the substrate and a bottom metal pattern as required by claim 1.

Furthermore, Aoki does not disclose forming a low temperature oxide as an insulating layer. As mentioned above, Aoki discloses the use of an HSC film. HSC is not a low temperature oxide. It is well established that HSC is a flowable oxide, which is basically a ceramic polymer. In support, applicant submits herewith a copy of U.S. Patent No. 5,981,354 to Spikes et al. ("Spikes"). Spikes discloses the use of a flowable oxide for forming a dielectric layer. (See Spikes, column 3, lines 6-8, and column 6, lines 14-18). Spikes discloses that the flowable oxide is preferably HSQ. (See Spikes, column 3, lines 2-14, and column 6, lines 12-39). The HSQ layer is deposited then heated which causes it to reflow and produce a substantially planar upper surface. Spike provides no disclosure supporting the Examiner's position that HSQ is a low temperature oxide. Applicant respectfully submits that a flowable oxide is not a low temperature oxide. The claimed low temperature oxide is formed at the temperature of 150~500 C°. In contrast, Aoki deposits the HSC film then performs a stepped heat treating process (i.e., 150 C°, 200 C° and 350 C°) followed by an additional heat treatment step at 400 C° to obtain a reflow characteristic and a substantially planar upper surface.

Finally, Aoki does not disclose forming an unfinished via hole by selectively removing the low temperature oxide for a prescribed thickness using the first photoresist pattern as a mask whereby the thickness of the low temperature oxide remaining inside the via hole is less than a thickness of an upper part of a damascene contact. This feature is not


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disclosed or suggested by Aoki. The Office Action recognizes this distinction by cited that the thickness in Aoki is equal to the thickness of the upper part.

Accordingly, applicant respectfully submits that Aoki does not disclose, teach or suggest the subject matter of amended claim 1. Claim 1 is allowable over Aoki. Claims 5-8 depend from claim 1 and are allowable over Aoki for at least the same reasons. Reconsideration and withdrawal of the rejection are respectfully requested.

Applicant respectfully submit that the claims define subject matter that is patentable over the prior art cited of record. It is respectfully submitted that the application is in condition for allowance. Should further issues require resolution prior to allowance, the Examiner is requested to telephone applicant's undersigned attorney at the number below. Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
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Enclosure: US Patent No. 5981354 to Spikes et al.